

US006798406B1

# (12) United States Patent Jones et al.

(10) Patent No.: US 6,798,406 B1

(45) **Date of Patent:** Sep. 28, 2004

## (54) STEREO IMAGES WITH COMFORTABLE PERCEIVED DEPTH

### (75) Inventors: **Graham Roger Jones**, Faringdon (GB);

Nicolas Steven Holliman, Wallingford (GB); Delman Lee, The Peak (HK)

(73) Assignee: Sharp Kabushiki Kaisha, Osaka (JP)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 431 days.

(21) Appl. No.: 09/663,461

(22) Filed: Sep. 15, 2000

#### (30) Foreign Application Priority Data

Sep.	15, 1999 (GB)	
(51)	Int. Cl. <sup>7</sup>	<b>G06T 15/00</b> ; H04N 13/00
(52)	U.S. Cl	<b>345/419</b> ; 348/42; 348/51
(58)	Field of Search	
		345/421; 348/42, 47, 51, 53

#### (56) References Cited

#### U.S. PATENT DOCUMENTS

4,647,965 A	3/1987	Imsand	358/88
5,175,616 A	* 12/1992	Milgram et al	348/47

#### FOREIGN PATENT DOCUMENTS

EP	0 641 132 A1	1/1995
EP	0 751 689	1/1997
EP	0 751 689 A2	2/1997
JP	60-236394	11/1985

#### OTHER PUBLICATIONS

Search Report, Application No. GB 9921638.4, dated Apr. 7, 2000

Lipton: "StereoGraphics: Developers' Handbook" Online! Stereographics Corporation, 1997.

European Search Report regarding Application No. 00 30 7993 dated Apr. 13, 2003.

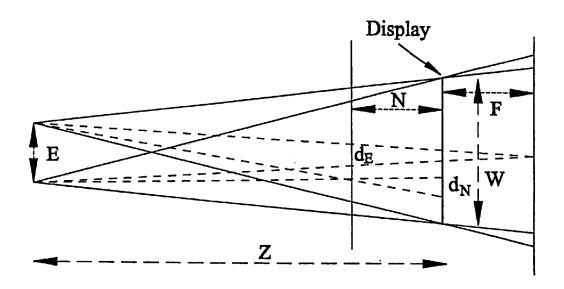
\* cited by examiner

Primary Examiner—Phu K. Nguyen (74) Attorney, Agent, or Firm—Renner, Otto, Boisselle &

#### (57) ABSTRACT

A method of producing a stereo image of a (real or simulated) scene using at least one (real or simulated) camera, which creates the impression of being a 3D image when viewed on a display by a user, wherein the depth of the scene is mapped onto a maximum perceived depth of the image on the display, and the maximum perceived depth is chosen to provide comfortable viewing for the user.

#### 15 Claims, 5 Drawing Sheets



Viewing geometry of a stereoscopic display